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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/719,072

11/21/2003

Mali Gong

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EXAMINER

GOLUB, MARCIA A

ART UNIT

PAPER NUMBER

2828

MAIL DATE

DELIVERY MODE

11/23/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

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**Office Action Summary**

Application No.

10/719,072

Applicant(s)

GONG ET AL.

Examiner

Marcia A. Golub

Art Unit

2828

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --****Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 November 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4, 6, 7 and 9-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 7 and 9-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

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| <p>1) <input type="checkbox"/> Notice of References Cited (PTO-892)</p> <p>2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)</p> <p>3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br/>Paper No(s)/Mail Date _____</p> | <p>4) <input type="checkbox"/> Interview Summary (PTO-413)<br/>Paper No(s)/Mail Date. _____</p> <p>5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)</p> <p>6) <input type="checkbox"/> Other: _____</p> |
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## DETAILED ACTION

### *Response to Arguments*

Applicant's arguments with respect to claims 1 and 6 have been considered but are moot in view of new grounds of rejection.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1-4, 6, 9 and 10** are rejected under 35 U.S.C. 102(b) as being anticipated by Dubé (5,619,522) hereinafter '522.

Figs 6 and 7 of '522 disclose a laser gain module comprising:

1, 6. "a laser slab being formed with a rectangular cross section [the cross section taken lengthwise out of the plane of the paper (Fig 6) is rectangular as can be seen in Fig 7] having one or more corner faces and including an undoped circumambient portion [YAG 431,441] and one doped central portion, [Nd-YAG 15]

wherein said undoped circumambient portion and said doped central portion are diffusion bonded without gaps between them [Diffusion bonding is a product by process limitation that does not have a patentable weight on the structure of the device. The reference discloses joining the two pieces with an adhesive material, therefore the final result is the same, namely, the two elements are joined together without gaps.]

said undoped circumambient portion having said corner faces [443] and a plurality of lateral surfaces used as inner reflective surfaces [433, 443], and all the plurality of lateral surfaces being planar;

and one or more pump source [91] providing a pump light [L], each pump source consisting of a high power diode array and its coupling system; (5/7-11)

wherein said pump light [L] from said one or more pump sources [91] directly incident into said laser slab through prior cut slab corner faces [446] of said undoped circumambient portion [431,441] without restriction to the incident angle or the

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polarization state of the pump light, firstly pass said undoped circumambient portion [441], secondly pass said doped central portion [15], thirdly pass said undoped circumambient portion again [431], and fourthly take inner reflection at the surface of said undoped circumambient portion [433], and by repeating these steps, achieve multi-pass absorption, and substantially absorbed by the said doped central portion during propagation; (7/52-53)

and wherein said laser slab outputs an amplified laser beam.”

2, 10. wherein corner faces of said laser slab are coated for high transmission for the wavelength of the pump light (11/50-52), and lateral faces of said slab are coated for high reflection for the wavelength of the pump light (13/37-39).

3. wherein a laser light [250] propagates inside the laser slab [200] in a zigzag optical path.” (Fig 7, 13/1-10)

4. wherein the step of absorbing achieves a high absorption efficiency through multi-pass absorption of pump light inside said laser slab (7/52-53).

9. wherein a cross section of said central portion [15] is circular.”

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 7, 11 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over ‘522 as applied to claim 6 above, and further in view of Tullock et al. (6,134,258) hereinafter ‘258.

Fig 6 of ‘522 discloses a laser gain module as described above but does not disclose:

7. “wherein the number of said corner faces is four.”

11. “wherein the input beam and the output beam are located at one same side of said laser slab, said input beam and said output beam forming an angle with each other.

12. wherein two mirrors are placed at another side of the said laser slab

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symmetrically with respect of said input beam and said output beam.”

However, Fig 9b of '258 discloses such configuration. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of '258 into the device of '522 by making four corner faces and placing mirrors on the other side of the gain medium symmetrically with respect to input and output beam for at least the purpose of increasing the amplification of the laser beam by passing it through the gain medium twice.

**Claim 14** is rejected under 35 U.S.C. 103(a) as being unpatentable over '522 as applied to claim 6 above, and further in view of Zhang (2002/0105997) hereinafter '997.

Figs 6-7 of '522 disclose a laser gain module as described above but do not disclose:

14. wherein said coupling system being a fiber bundle.”

Zhang discloses various configurations of focusing pump light into the laser slab including using fiber bundle [6]. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of '997 into the device of '522 by using fiber bundle to couple light into the gain medium for at least the purpose of better focusing the pump light into the laser slab.

**Claim 13** is rejected under 35 U.S.C. 103(a) as being unpatentable over '522 and '997 as applied to claim 14 above, and further in view of Sasaya et al. (2002/0054282) hereinafter '282.

Figs 6-7 of '522 disclose a laser gain module as described above but do not disclose:

13. “wherein said coupling system including two cylindrical lenses and a lens duct, said two cylindrical lenses being placed between the diode array and the lens duct.”

Zhang discloses various configurations of focusing pump light into the laser slab including using lenses and diode arrays [3,12,13,17,18,22,23,26]. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of '997 into the device of '522 by using two cylindrical lenses being placed between the diode array and the lens duct to couple light into the gain medium for at least the purpose of better focusing the pump light into the laser slab.

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'522 and '977 do not disclose:

"generatrices of said two cylindrical lenses are orthogonal to each other and are parallel to fast axis and slow axis of said diode array, respectively."

However, paragraph 60 of '282 discloses arranging the lenses such that their generatrices are perpendicular to each other.

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of '282 into the device of '522 and '997 by arranging the lenses such that their generatrices are perpendicular to each other and parallel to the fast and slow axis of the diode array for at least the purpose of producing maximum magnification of the pump light.

#### **Conclusion**

**THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

#### **Contact Info**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marcia A. Golub whose telephone number is 571-272-8602. The examiner can normally be reached on M-F 9-6 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on 571-272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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